通过多个 BRI 接口配置多链路 PPP

目录

简介

本文展示拨通有多个BRI接口的另一个路由器的一个路由器的配置示例有多个BRI接口的，并且建立多链路PPP (MPPP)连接。拨号的路由器必须识别没有其他信道不是可用的在远程BRI，然后拨号下个远程BRI电话号码设立其他开辟信道。

两路由器使用拨号配置文件结合物理BRI接口。使用循环组，您能如配置多个BRI接口的MPPP所示也配置与拨号循环组的此设置。

关于拨号配置文件的更多信息请参阅拨号程序配置文件的配置与故障排除。

先决条件

要求

本文档没有任何特定的要求。

使用的组件

本文档中的信息基于以下软件和硬件版本：

- 有一四端口BRI模块运行Cisco IOS软件版本12.1(4)的Cisco 3640。
- 与运行Cisco IOS软件版本12.1(4)的四个BRI接口的Cisco4000。
- 在每一侧的两个BRI电路。这些BRI没有在搜索组中配置。

本文档中的信息都是基于特定实验室环境中的设备创建的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您是在真实网络上操作，请确保您在使用任何命令前已经了解其潜在影响。

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

配置

本部分提供有关如何配置本文档所述功能的信息。

注意： 要寻找关于用于本文的命令的其他信息，请使用theCommand查找工具(仅限注册用户)

网络图

本文档使用以下网络设置：

配置

本文档使用以下配置：

- 梅勒妮(Cisco 3640)
- torito (Cisco4000)

梅勒妮(Cisco 3640)

```
Current configuration:

 version 12.1
 service timestamps debug datetime msec
 service timestamps log datetime msec
 no service password-encryption
 !
 hostname melanie
 !
 enable password ww
 !
 username torito password 0 ww
!--- Username for remote router (torito) and shared
secret (used for !--- Challenge Handshake Authentication
Protocol (CHAP) authentication). !--- Shared secret must
be the same on both sides. isdn switch-type basic-net3 !
interface Loopback0 ip address 10.10.10.1 255.255.255.0
! interface BRI0/0 no ip address shutdown ! interface
BRI2/0 no ip address shutdown ! interface BRI2/1 !---
First BRI interface. description ISDN number 6104 !---
Phone number of this BRI. no ip address encapsulation
ppp dialer pool-member 1 !--- Member of dialer pool 1.
isdn switch-type basic-net3 no cdp enable ppp
authentication chap !--- Use CHAP authentication. ppp
multilink !--- Enable multilink on the physical
interface. ! interface BRI2/2 !--- Second BRI interface.
description ISDN number 6103 !--- Phone number of this
```

```
BRI. no ip address encapsulation ppp dialer pool-member
1 !--- Member of dialer pool 1. isdn switch-type basic-
net3 no cdp enable ppp authentication chap !--- Use CHAP
authentication. ppp multilink !--- Enable multilink on
the physical interface. ! interface BRI2/3 no ip address
shutdown ! interface Dialer2 !--- Dialer interface used
for dialout. ip unnumbered Loopback0 !--- Use the
loopback0 address. !--- Static route on remote router
points to this Loopback0 address. encapsulation ppp
dialer pool 1 !--- Defines dialer pool 1. !--- BRI 2/1
and BRI 2/2 are members of this pool. dialer string 6113
!--- Dial 6113 first . dialer string 6114 !--- If 6113
fails, dial 6114 . !--- Both numbers are required.
Otherwise, the third call encounters a busy signal.
dialer load-threshold 1 either !--- Load level (in
either direction) for traffic at which additional !---
connections will be added to the MPPP bundle. !--- Load
level values range from 1 (unloaded) to 255 (fully
loaded). dialer-group 1 !--- Apply interesting traffic
definition from dialer-list 1. no cdp enable ppp
authentication chap !--- Use CHAP authentication. ppp
multilink !--- Allow MPPP for the four BRI channels. !
ip route 10.10.12.1 255.255.255.255 Dialer2 !--- Static
route to remote router. !--- All traffic destined for
the remote router must use int Dialer2 ! dialer-list 1
protocol ip permit !--- All IP traffic is designated as
interesting. !--- This is applied to interface dialer2
with the help of dialer-group 1. line con 0 transport
input none line 97 114 modem InOut transport input all
line aux 0 line vty 0 4 login ! end
```

注意这些点在Cisco 3640里(梅勒妮)的配置：

- 配置使用拨号配置文件。BRI接口是拨号池的成员。所有配置设置特定对目的地在interface dialer 2配置里配置。
- 拨号接口有两dialer string。切记有在远程路由器(torito)的两个BRI接口。由于那些BRI未在搜索组中配置由Telco，路由器梅勒妮必须单个拨号每个BRI。使用多个拨号字符串，第一个电话号码总是拨号。只有当该呼叫发生故障执行拨号接口尝试第二dialer string。当他们用于顺序，我们能如所需要定义许多dialer string。
- MPPP的拨号负载门限值设置到一个，是最低。此值可以更改根据您的流量模式和需求。然而，如果定义了更高的负载门限，另外的链路只将被添加，当有负载超出该定义。参考部分调整和可选命令关于如何控制信道的新增内容的更多信息到多链路捆绑。
- 远程路由器点的静态主机路由在interface dialer 2.流量然后转发池(BRI 2/1和BRI 2/2)的物理成员。创建静态路由(或请使用一个路由协议)应该使用多链路连接的目标流量的。

torito (Cisco4000)

```
Current configuration:
 !
 version 12.1
 service timestamps debug datetime msec
 service timestamps log datetime msec
 no service password-encryption
 !
 hostname torito
 !
 username melanie password 0 ww
!--- Username for remote router (melanie) and shared
secret !--- (used for CHAP authentication). !--- Shared
secret must be the same on both sides. ! isdn switch-
```

```
type basic-net3 interface Loopback0 ip address
10.10.12.1 255.255.255.0 ! interface BRI0 no ip address
shutdown ! interface BRI1 !--- Phone number is 6113. no
ip address encapsulation ppp dialer pool-member 1 !---
Member of dialer pool 1. isdn switch-type basic-net3 ppp
authentication chap !--- Use CHAP authentication. ppp
multilink !--- Enable multilink on the physical
interface. !--- Unless you use CLID/DNIS based binding,
this command is required. !--- See Configuring and
Troubleshooting Dialer Profiles for more information. !
interface BRI2 !--- Phone number is 6114. no ip address
encapsulation ppp dialer pool-member 1 !--- Member of
dialer pool 1. isdn switch-type basic-net3 ppp
authentication chap !--- Use CHAP authentication. ppp
multilink !--- Enable multilink on the physical
interface. !--- Unless you use CLID/DNIS based binding,
this command is required. !--- See Configuring and
Troubleshooting Dialer Profiles for more information. !
interface BRI3 no ip address shutdown ! interface
Dialer1 ip unnumbered Loopback0 !--- Use the Loopback0
address. !--- The static route on remote router points
to this Loopback0 address. encapsulation ppp dialer pool
1 !--- Defines Dialer pool 1. !--- BRI 1 and BRI 2 are
members of this pool. dialer remote-name melanie !---
Specifies the name of the remote router. !--- This name
matches the name used by the remote router to
authenticate itself. dialer-group 1 !--- Apply
interesting traffic definition from dialer-list 1. ppp
authentication chap !--- Use CHAP authentication. ppp
multilink !--- Allow MPPP for the 4 BRI channels. ! ip
route 10.10.10.1 255.255.255.255 Dialer1 !--- Static
route to remote router. !--- All traffic destined for
the remote router must use int Dialer1. dialer-list 1
protocol ip permit !--- All IP traffic is designated as
interesting. !--- This is applied to interface dialer2
using dialer-group 1. line con 0 exec-timeout 0 0
transport input none line aux 0 exec-timeout 0 0
transport input all line vty 0 4 password ww login ! end
```

调整和可选命令

您能使用in命令此部分调节MPPP连接的行为。您能通过仔细的调整的这样参数控制开销，帮助避免浪费和多余的使用数据链路。在启动拨号的侧必须实现这些命令。

- **dialer load-threshold load[outbound|入站|二者之一]** ？ ？ ？您能配置MPPP，以便另外的信道出来，在主要信道设立之后。在这种情况下，设置在**dialer load-threshold load命令的**负载阈值到1。所以，其他信道启动，并且他们继续坚持(即他们不摆动)。如果负载门限设置为更高的值，多信道可能根据在链路间的负载摆动。如果要有根据流量如所需要被添加的，另外的信道，设置负载门限对appropriate值在1和255之间。例如，如果另外的信道是出现在总容量的50百分比，应该设置阈值到128 (0.50*255)。
- **ppp timeout multilink link remove seconds** ？ ？ ？当负载变化，请使用此命令防止多链路连接飘荡。例如，如果负载阈值设置为15 (15/255 = 6%)，并且数据流超出阈值时，这时会出现其他线路。当流量低于阈值时，附加线路取消。在数据速率变化剧烈的情况中，多信道停留一段特定的时间则比较有益，即使负载阈值低于指定值。指定多链路超时低于控制所有链路超时的拨号程序空闲超时。
- **ppp timeout multilink link add seconds** ？ ？ ？请使用此命令防止多条链路的新增内容到MP束，直到高数据流为指定的时间间隔接收。这样可以防止突发 数据流引发额外的线路。

- **dialer max-link number** ？ ？ ？为拨号配置文件要指定，链路最大到可以随时是UP的远程目的地，请使用**dialer max-link命令**在接口配置模式。在本例中，我们有两个BRI (或四B信道)在梅勒妮为拨出配置。默认情况下，所以，全部四个信道在MPPP连接启动。然而，如果只希望三B信道启动，您能使用**dialer max-link命令**限制链路数量。

验证

本部分所提供的信息可用于确认您的配置是否正常工作。

显示命令

请使用这些命令验证连接：

命令输出解释程序工具（仅限注册用户）支持某些 **show** 命令，使用此工具可以查看对 show 命令输出的分析。

- **show isdn status** ？ ？ ？指示路由器是否用ISDN交换机正确通信。在输出中，您需要验证`1`，并且`2=MULTIPLE_FRAME_ESTABLISHED`出现。此指令也显示活动的呼叫的数量。欲知更多信息，请参阅使用show isdn status命令关于BRI故障排除。
- **show ppp multilink** ？ ？ ？显示关于是活跃的多链路捆绑的信息。使用此指令验证多链路连接。
- **show dialer [interface** *type number*] ？ ？ ？显示为DDR配置的接口的一般诊断信息。如果拨号程序适当地过来，`Dialer state is data link layer up`消息必须出现。如果`physical layer up`出现，含义线路通信协议出来，但是网络控制协议(NCP)没有。启动拨号的数据包的源地址和目标地址显示在 dial reason line 中。此**show**命令也显示计时器的配置和连接超时前的时间。
- **show caller user username detail** ？ ？ ？表示特定用户的参数例如分配的IP地址，PPP和PPP捆绑参数，等等。如果您的Cisco IOS版本不支持此命令，请使用**show user命令**。

show 命令输出

在链路连接后，**show ppp multilink命令**显示多链路捆绑的成员在每个路由器的。注意到在路由器梅勒妮，捆绑名是torito，当路由器torito的捆绑名是梅勒妮时。属于套件的BRI接口和B信道也指示。

```
melanie#show ppp multilink Dialer2, bundle name is torito 0 lost fragments, 0 reordered, 0
unassigned 0 discarded, 0 lost received, 1/255 load 0x8 received sequence, 0x8 sent sequence
Member links: 4 (max not set, min not set) BRI2/1:1 BRI2/1:2 BRI2/2:1 BRI2/2:2 torito#show ppp
multilink Dialer1, bundle name is melanie 0 lost fragments, 0 reordered, 0 unassigned 0
discarded, 0 lost received, 1/255 load 0x8 received sequence, 0x8 sent sequence Member links: 4
(max not set, min not set) BRI1:1 BRI1:2 BRI2:1 BRI2:2
```

故障排除

本部分提供的信息可用于对配置进行故障排除。

故障排除命令

注意： 在发出 **debug** 命令之前，请参阅有关 Debug 命令的重要信息。

- **debug dialer** ？ ？ ？显示关于在拨号接口接收的数据包的DDR调试信息。此信息可帮助保证有

能使用拨号接口的关注数据流。

- **调试isdn q931???shows**呼叫建立并且切断ISDN网络连接(层3)。
- **debug ppp协商**？ ？ ？显示关于PPP流量的信息并且交换，当协商链路控制协议(LCP)、验证和网络控制协议时(NCP)。成功的PPP协商将首先开放LCP状态，然后进行验证，最后进行NCP协商。当LCP协商进展中时，多链路参数例如最大接收重建单元(MRRU)设立。
- **debug ppp authentication** ？ ？ ？显示PPP认证协议消息，和包括CHAP信息包交换和密码认证协议交换。
- **debug ppp error** ？ ？ ？显示协议错误和错误统计信息关联与PPP连接协商和操作。

debug 命令的输出

关于如何排除故障根据每BRI基本类型的多链路的信息，请参阅ISDN BRI链路的故障排除第二个B-通道呼叫失败。当您有多链路功能在1个BRI (2 B信道)，您能添加BRI到套件。

启用在Troubleshooting Commands部分描述的调试，然后**ping**远程路由器的地址。ping必须启动拨号，并且连接到远程路由器。当每其他链路启动，被添加到MPPP套件。

```
melanie#show debug Dial on demand: Dial on demand events debugging is on PPP: PPP authentication
debugging is on PPP protocol negotiation debugging is on ISDN: ISDN Q931 packets debugging is on
ISDN Q931 packets debug DSLs. (On/Off/No DSL:1/0/-) melanie#ping 10.10.12.1 Type escape sequence
to abort. Sending 5, 100-byte ICMP Echos to 10.10.12.1, timeout is 2 seconds: *Mar 1
05:30:45.502: BR2/1 DDR: rotor dialout [priority] !--- Use BRI 2/1 to dial out. *Mar 1
05:30:45.502: BR2/1 DDR: Dialing cause ip (s=10.10.10.1, d=10.10.12.1) !--- DDR dialing cause is
a ping to the remote router. *Mar 1 05:30:45.502: BR2/1 DDR: Attempting to dial 6113 !--- Dial
the first number (6113) configured with dialer string command. !--- This number corresponds to
the first BRI on torito. *Mar 1 05:30:45.506: ISDN BR2/1: TX -> SETUP pd = 8 callref = 0x77 *Mar
1 05:30:45.506: Bearer Capability i = 0x8890 *Mar 1 05:30:45.506: Channel ID i = 0x83 *Mar 1
05:30:45.506: Called Party Number i = 0x80, '6113', Plan:Unknown, Type:Unknown *Mar 1
05:30:45.574: ISDN BR2/1: RX <- CALL_PROC pd = 8 callref = 0xF7 *Mar 1 05:30:45.574: Channel ID
i = 0x89 *Mar 1 05:30:46.026: ISDN BR2/1: RX <- CONNECT pd = 8 callref = 0xF7 *Mar 1
05:30:46.030: ISDN BR2/1: TX -> CONNECT_ACK pd = 8 callref = 0x77 !--- Call connects. *Mar 1
05:30:46.030: %LINK-3-UPDOWN: Interface BRI2/1:1, changed state to up *Mar 1 05:30:46.034:
BR2/1:1: interface must be fifo queue, force fifo *Mar 1 05:30:46.034: %DIALER-6-BIND: Interface
BR2/1:1 bound to profile Di2 !--- Call is bound to interface Dialer 2. *Mar 1 05:30:46.034:
BR2/1:1 PPP: Treating connection as a callout *Mar 1 05:30:46.034: BR2/1:1 PPP: Phase is
ESTABLISHING, Active Open !--- LCP negotiation begins. *Mar 1 05:30:46.034: BR2/1:1 LCP: O
CONFREQ [Closed] id 116 len 29 *Mar 1 05:30:46.034: BR2/1:1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 1 05:30:46.034: BR2/1:1 LCP: MagicNumber 0x513DE606 (0x0506513DE606) *Mar 1 05:30:46.034:
BR2/1:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.034: BR2/1:1 LCP: EndpointDisc 1 Local
(0x130A016D656C616E6965) *Mar 1 05:30:46.074: BR2/1:1 LCP: I CONFREQ [REQsent] id 11 len 28 *Mar
1 05:30:46.074: BR2/1:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.074: BR2/1:1 LCP:
MagicNumber 0x00B3729B (0x050600B3729B) *Mar 1 05:30:46.074: BR2/1:1 LCP: MRRU 1524 (0x110405F4)
*Mar 1 05:30:46.074: BR2/1:1 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1
05:30:46.074: BR2/1:1 LCP: O CONFACK [REQsent] id 11 len 28 *Mar 1 05:30:46.074: BR2/1:1 LCP:
AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.074: BR2/1:1 LCP: MagicNumber 0x00B3729B
(0x050600B3729B) *Mar 1 05:30:46.074: BR2/1:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.074:
BR2/1:1 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:30:46.086: BR2/1:1 LCP: I
CONFACK [ACKsent] id 116 len 29 *Mar 1 05:30:46.086: BR2/1:1 LCP: AuthProto CHAP (0x0305C22305)
*Mar 1 05:30:46.086: BR2/1:1 LCP: MagicNumber 0x513DE606 (0x0506513DE606) *Mar 1 05:30:46.086:
BR2/1:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.086: BR2/1:1 LCP: EndpointDisc 1 Local
(0x130A016D656C616E6965) *Mar 1 05:30:46.086: BR2/1:1 LCP: State is Open !--- LCP negotiation is
complete. *Mar 1 05:30:46.090: BR2/1:1 PPP: Phase is AUTHENTICATING, by both !--- PPP
authentication by both sides begins. *Mar 1 05:30:46.090: BR2/1:1 CHAP: O CHALLENGE id 39 len 28
from "melanie" *Mar 1 05:30:46.110: BR2/1:1 CHAP: I CHALLENGE id 7 len 27 from "torito" *Mar 1
05:30:46.110: BR2/1:1 CHAP: O RESPONSE id 7 len 28 from "melanie" *Mar 1 05:30:46.126: BR2/1:1
CHAP: I SUCCESS id 7 len 4 *Mar 1 05:30:46.134: BR2/1:1 CHAP: I RESPONSE id 39 len 27 from
"torito" *Mar 1 05:30:46.138: BR2/1:1 CHAP: O SUCCESS id 39 len 4 !--- CHAP authentication is
successful *Mar 1 05:30:46.138: BR2/1:1 PPP: Phase is VIRTUALIZED *Mar 1 05:30:46.138: Di2 PPP:
Phase is UP *Mar 1 05:30:46.138: Di2 IPCP: O CONFREQ [Closed] id 14 len 10 *Mar 1 05:30:46.138:
```

Di2 IPCP: Address 10.10.10.1 (0x03060A0A0A01) *Mar 1 05:30:46.142: BR2/1:1 MLP: torito, multilink up, first link *Mar 1 05:30:46.162: Di2 IPCP: I CONFREQ [REQsent] id 7 len 10 *Mar 1 05:30:46.162: Di2 IPCP: Address 10.10.12.1 (0x03060A0A0C01) *Mar 1 05:30:46.162: Di2 IPCP: O CONFACK [REQsent] id 7 len 10 *Mar 1 05:30:46.162: Di2 IPCP: Address 10.10.12.1 (0x03060A0A0C01) *Mar 1 05:30:46.166: Di2 CDPCP: I CONFREQ [Not negotiated] id 7 len 4 *Mar 1 05:30:46.166: Di2 LCP: O PROTREJ [Open] id 14 len 10 protocol CDPCP (0x820701070004) *Mar 1 05:30:46.182: Di2 IPCP: I CONFACK [ACKsent] id 14 len 10 *Mar 1 05:30:46.182: Di2 IPCP: Address 10.10.10.1 (0x03060A0A0A01) *Mar 1 05:30:46.182: Di2 IPCP: State is Open *Mar 1 05:30:46.182: Di2 DDR: dialer protocol up *Mar 1 05:30:46.182: Di2 IPCP: Install route to 10.10.12.1 *Mar 1 05:30:46.186: BR2/1 DDR: rotor dialout [priority] *Mar 1 05:30:46.186: BR2/1 DDR: **Attempting to dial 6113** *!--- Dial the first number (6113) configured with dialer string command. !--- This number corresponds to the first BRI on torito. !--- Remember there is one B-channel available on the remote BRI.* *Mar 1 05:30:46.186: ISDN BR2/1: TX -> SETUP pd = 8 callref = 0x78 *Mar 1 05:30:46.186: Bearer Capability i = 0x8890 *Mar 1 05:30:46.190: Channel ID i = 0x83 *Mar 1 05:30:46.190: Called Party Number i = 0x80, '6113', Plan:Unknown, Type:Unknown *Mar 1 05:30:46.274: ISDN BR2/1: RX <- CALL_PROC pd = 8 callref = 0xF8 *Mar 1 05:30:46.274: Channel ID i = 0x8A *Mar 1 05:30:46.726: ISDN BR2/1: RX <- CONNECT pd = 8 callref = 0xF8 *Mar 1 05:30:46.730: ISDN BR2/1: TX -> CONNECT_ACK pd = 8 callref = 0x78 *Mar 1 05:30:46.730: %LINK-3-UPDOWN: Interface **BRI2/1:2, changed state to up** *!--- Second B-channel is connected.* *Mar 1 05:30:46.730: BR2/1:2: interface must be fifo queue, force fifo *Mar 1 05:30:46.734: %DIALER-6-BIND: Interface BR2/1:2 bound to profile Di2 *Mar 1 05:30:46.734: %ISDN-6-CONNECT: Interface BRI2/1:1 is now connected to 6113 torito *Mar 1 05:30:46.734: BR2/1:2 PPP: Treating connection as a callout *Mar 1 05:30:46.734: BR2/1:2 PPP: Phase is ESTABLISHING, Active Open *Mar 1 05:30:46.734: BR2/1:2 LCP: O CONFREQ [Closed] id 31 len 29 *Mar 1 05:30:46.734: BR2/1:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.734: BR2/1:2 LCP: MagicNumber 0x513DE8C4 (0x0506513DE8C4) *Mar 1 05:30:46.734: BR2/1:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.734: BR2/1:2 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:30:46.774: BR2/1:2 LCP: I CONFREQ [REQsent] id 12 len 28 *Mar 1 05:30:46.774: BR2/1:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.774: BR2/1:2 LCP: MagicNumber 0x00B37556 (0x050600B37556) *Mar 1 05:30:46.774: BR2/1:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.774: BR2/1:2 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:30:46.774: BR2/1:2 LCP: O CONFACK [REQsent] id 12 len 28 *Mar 1 05:30:46.774: BR2/1:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.774: BR2/1:2 LCP: MagicNumber 0x00B37556 (0x050600B37556) *Mar 1 05:30:46.774: BR2/1:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.774: BR2/1:2 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:30:46.786: BR2/1:2 LCP: I CONFACK [ACKsent] id 31 len 29 *Mar 1 05:30:46.786: BR2/1:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:30:46.786: BR2/1:2 LCP: MagicNumber 0x513DE8C4 (0x0506513DE8C4) *Mar 1 05:30:46.786: BR2/1:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:30:46.786: BR2/1:2 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:30:46.786: BR2/1:2 LCP: State is Open *Mar 1 05:30:46.786: BR2/1:2 PPP: Phase is AUTHENTICATING, by both *Mar 1 05:30:46.786: BR2/1:2 CHAP: O CHALLENGE id 14 len 28 from "melanie" *Mar 1 05:30:46.806: BR2/1:2 CHAP: I CHALLENGE id 7 len 27 from "torito" *Mar 1 05:30:46.806: BR2/1:2 CHAP: O RESPONSE id 7 len 28 from "melanie" *Mar 1 05:30:46.822: BR2/1:2 **CHAP: I SUCCESS** id 7 len 4 *Mar 1 05:30:46.834: BR2/1:2 CHAP: I RESPONSE id 14 len 27 from "torito" *Mar 1 05:30:46.834: BR2/1:2 **CHAP: O SUCCESS** id 14 len 4 *!--- PPP authentication is complete.* *Mar 1 05:30:46.834: BR2/1:2 PPP: Phase is VIRTUALIZED *Mar 1 05:30:46.834: BR2/1:2 MLP: torito, multilink up *Mar 1 05:30:47.138: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI2/1:1, changed state to up *Mar 1 05:30:47.834: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI2/1:2, changed state to up *Mar 1 05:30:52.734: %ISDN-6-CONNECT: Interface BRI2/1:2 is now connected to 6113 torito *!--- Both B-channels are up.* melanie# *Mar 1 05:31:16.186: BR2/2 DDR: rotor dialout [priority] *!--- Dialout using BRI 2/2.* *Mar 1 05:31:16.186: BR2/2 DDR: Attempting to dial 6113 *!--- Dial the first number (6113) configured with dialer string command. !--- This number corresponds to the first BRI on torito. !--- Remember there are no B-channels available on the remote BRI.* *Mar 1 05:31:16.186: ISDN BR2/2: TX -> SETUP pd = 8 callref = 0x79 *Mar 1 05:31:16.186: Bearer Capability i = 0x8890 *Mar 1 05:31:16.186: Channel ID i = 0x83 *Mar 1 05:31:16.190: Called Party Number i = 0x80, '6113', Plan:Unknown, Type:Unknown *Mar 1 05:31:16.274: ISDN BR2/2: RX <- CALL_PROC pd = 8 callref = 0xF9 *Mar 1 05:31:16.274: Channel ID i = 0x89 *Mar 1 05:31:16.298: ISDN BR2/2: RX <- PROGRESS pd = 8 callref = 0xF9 *Mar 1 05:31:16.302: Progress Ind i = 0x8188 - In-band info or appropriate now available *Mar 1 05:31:16.318: **ISDN BR2/2: RX <- DISCONNECT** pd = 8 callref = 0xF9 *Mar 1 05:31:16.318: **Cause i = 0x8191 - User busy** *!--- We receive a user busy signal, because there are no available !--- B-channels on that BRI, and melanie must dial the next BRI on torito.* *Mar 1 05:31:16.322: BRI2/2: wait for isdn carrier timeout, call id=0x8079 *Mar 1 05:31:16.322: BR2/2 DDR: Attempting to dial 6114 *!--- Dial the second number (6114) configured with dialer string command. !--- This number corresponds to the second BRI on torito. !--- Remember both B-channels are available on that remote BRI.* *Mar 1 05:31:16.326: ISDN BR2/2:

TX -> RELEASE pd = 8 callref = 0x79 *Mar 1 05:31:16.326: Cause i = 0x8091 - User busy *!--- Release message from the previous failed call.* *Mar 1 05:31:16.346: ISDN BR2/2: TX -> SETUP pd = 8 callref = 0x7A *!--- Setup message for next call.* *Mar 1 05:31:16.346: Bearer Capability i = 0x8890 *Mar 1 05:31:16.346: Channel ID i = 0x83 *Mar 1 05:31:16.346: Called Party Number i = 0x80, '6114', Plan:Unknown, Type:Unknown *Mar 1 05:31:16.362: ISDN BR2/2: RX <- RELEASE_COMP pd = 8 callref = 0xF9 *!--- Release acknowledgement for previous failed call.* *Mar 1 05:31:16.422: ISDN BR2/2: RX <- CALL_PROC pd = 8 callref = 0xFA *!--- ISDN call progress message.* *Mar 1 05:31:16.426: Channel ID i = 0x89 *Mar 1 05:31:16.878: ISDN BR2/2: RX <- CONNECT pd = 8 callref = 0xFA *Mar 1 05:31:16.882: ISDN BR2/2: TX -> CONNECT_ACK pd = 8 callref = 0x7A *Mar 1 05:31:16.882: %LINK-3-UPDOWN: **Interface BRI2/2:1, changed state to up** *!--- Call is connected on BRI 2/2 B-channel 1.* *Mar 1 05:31:16.882: BR2/2:1: interface must be fifo queue, force fifo *Mar 1 05:31:16.882: %DIALER-6-BIND: Interface BR2/2:1 bound to profile Di2 *!--- Call is bound to interface Dialer 2.* *Mar 1 05:31:16.886: BR2/2:1 PPP: Treating connection as a callout *Mar 1 05:31:16.886: BR2/2:1 PPP: Phase is ESTABLISHING, Active Open *Mar 1 05:31:16.886: BR2/2:1 LCP: O CONFREQ [Closed] id 31 len 29 *Mar 1 05:31:16.886: BR2/2:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:16.886: BR2/2:1 LCP: MagicNumber 0x513E5E8D (0x0506513E5E8D) *Mar 1 05:31:16.886: BR2/2:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:16.886: BR2/2:1 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:31:16.926: BR2/2:1 LCP: I CONFREQ [REQsent] id 11 len 28 *Mar 1 05:31:16.926: BR2/2:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:16.926: BR2/2:1 LCP: MagicNumber 0x00B3EB20 (0x050600B3EB20) *Mar 1 05:31:16.926: BR2/2:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:16.926: BR2/2:1 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:31:16.926: BR2/2:1 LCP: O CONFACK [REQsent] id 11 len 28 *Mar 1 05:31:16.926: BR2/2:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:16.926: BR2/2:1 LCP: MagicNumber 0x00B3EB20 (0x050600B3EB20) *Mar 1 05:31:16.926: BR2/2:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:16.926: BR2/2:1 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:31:16.938: BR2/2:1 LCP: I CONFACK [ACKsent] id 31 len 29 *Mar 1 05:31:16.938: BR2/2:1 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:16.938: BR2/2:1 LCP: MagicNumber 0x513E5E8D (0x0506513E5E8D) *Mar 1 05:31:16.938: BR2/2:1 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:16.938: BR2/2:1 LCP: EndpointDisc 1 Local (0x130A016D656C616E6965) *Mar 1 05:31:16.938: BR2/2:1 LCP: State is Open *Mar 1 05:31:16.938: BR2/2:1 PPP: Phase is AUTHENTICATING, by both *Mar 1 05:31:16.938: BR2/2:1 CHAP: O CHALLENGE id 14 len 28 from "melanie" *Mar 1 05:31:16.958: BR2/2:1 CHAP: I CHALLENGE id 6 len 27 from "torito" *Mar 1 05:31:16.958: BR2/2:1 CHAP: O RESPONSE id 6 len 28 from "melanie" *Mar 1 05:31:16.974: BR2/2:1 **CHAP: I SUCCESS** id 6 len 4 *Mar 1 05:31:16.986: BR2/2:1 CHAP: I RESPONSE id 14 len 27 from "torito" *Mar 1 05:31:16.986: BR2/2:1 **CHAP: O SUCCESS** id 14 len 4 *!--- CHAP authentication is successful.* *Mar 1 05:31:16.986: BR2/2:1 PPP: Phase is VIRTUALIZED *Mar 1 05:31:16.990: BR2/2:1 MLP: torito, multilink up *Mar 1 05:31:17.986: %LINEPROTO-5-UPDOWN: Line protocol on Interface BRI2/2:1, changed state to up *Mar 1 05:31:22.886: %ISDN-6-CONNECT: **Interface BRI2/2:1 is now connected to 6114 torito** *!--- Call connection is complete.* melanie# *Mar 1 05:31:46.186: BR2/2 DDR: rotor dialout [priority] *Mar 1 05:31:46.186: BR2/2 DDR: **Attempting to dial 6113** *!--- Dial the first number (6113) configured with dialer string command. !--- This number corresponds to the first BRI on torito. !--- Remember there are no B-channels available on the remote BRI.* *Mar 1 05:31:46.186: ISDN BR2/2: TX -> SETUP pd = 8 callref = 0x7B *Mar 1 05:31:46.186: Bearer Capability i = 0x8890 *Mar 1 05:31:46.186: Channel ID i = 0x83 *Mar 1 05:31:46.190: Called Party Number i = 0x80, '6113', Plan:Unknown, Type:Unknown *Mar 1 05:31:46.274: Channel ID i = 0x8A *Mar 1 05:31:46.302: ISDN BR2/2: RX <- PROGRESS pd = 8 callref = 0xFB *Mar 1 05:31:46.302: Progress Ind i = 0x8188 - In-band info or appropriate now available *Mar 1 05:31:46.318: **ISDN BR2/2: RX <- DISCONNECT** pd = 8 callref = 0xFB *Mar 1 05:31:46.322: **Cause i = 0x8191 - User busy** *!--- We receive a user busy signal, since there are no available B-channels. !--- on that BRI melanie must dial the next BRI on torito.* *Mar 1 05:31:46.322: BRI2/2: wait for isdn carrier timeout, call id=0x807B *Mar 1 05:31:46.326: **BR2/2 DDR: Attempting to dial 6114** *!--- Dial the second number (6114) configured with dialer string command. !--- This number corresponds to the second BRI on torito. !--- Remember there is one B-channels available on that remote BRI.* *Mar 1 05:31:46.326: ISDN BR2/2: **TX -> RELEASE** pd = 8 callref = 0x7B *Mar 1 05:31:46.326: Cause i = 0x8091 - User busy *!--- Release message from the previous failed call.* *Mar 1 05:31:46.346: ISDN BR2/2: TX -> SETUP pd = 8 callref = 0x7C *!--- Setup message for next call.* *Mar 1 05:31:46.346: Bearer Capability i = 0x8890 *Mar 1 05:31:46.346: Channel ID i = 0x83 *Mar 1 05:31:46.346: Called Party Number i = 0x80, '6114', Plan:Unknown, Type:Unknown *Mar 1 05:31:46.362: ISDN BR2/2: **RX <- RELEASE_COMP** pd = 8 callref = 0xFB *!--- Release acknowledgement for previous failed call.* *Mar 1 05:31:46.422: ISDN BR2/2: RX <- CALL_PROC pd = 8 callref = 0xFC *Mar 1 05:31:46.426: Channel ID i = 0x8A *Mar 1 05:31:46.878: ISDN BR2/2: RX <- CONNECT pd = 8 callref = 0xFC *Mar 1 05:31:46.882: ISDN BR2/2: TX -> CONNECT_ACK pd = 8 callref = 0x7C *Mar 1 05:31:46.882: %LINK-3-UPDOWN: Interface **BRI2/2:2, changed state to up** *!--- Call is connected on BRI 2/2 B-channel 2.* *Mar 1 05:31:46.882: BR2/2:2: interface must be fifo queue, force fifo *Mar 1 05:31:46.882: %DIALER-6-BIND: **Interface BR2/2:2 bound to profile Di2** *!--- Call is bound to

```
interface Dialer 2. *Mar 1 05:31:46.886: BR2/2:2 PPP: Treating connection as a callout *Mar 1
05:31:46.886: BR2/2:2 PPP: Phase is ESTABLISHING, Active Open *Mar 1 05:31:46.886: BR2/2:2 LCP:
O CONFREQ [Closed] id 24 len 29 *Mar 1 05:31:46.886: BR2/2:2 LCP: AuthProto CHAP (0x0305C22305)
*Mar 1 05:31:46.886: BR2/2:2 LCP: MagicNumber 0x513ED3BF (0x0506513ED3BF) *Mar 1 05:31:46.886:
BR2/2:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:46.886: BR2/2:2 LCP: EndpointDisc 1 Local
(0x130A016D656C616E6965) *Mar 1 05:31:46.922: BR2/2:2 LCP: I CONFREQ [REQsent] id 10 len 28 *Mar
1 05:31:46.922: BR2/2:2 LCP: AuthProto CHAP (0x0305C22305) *Mar 1 05:31:46.926: BR2/2:2 LCP:
MagicNumber 0x00B46053 (0x050600B46053) *Mar 1 05:31:46.926: BR2/2:2 LCP: MRRU 1524 (0x110405F4)
*Mar 1 05:31:46.926: BR2/2:2 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1
05:31:46.926: BR2/2:2 LCP: O CONFACK [REQsent] id 10 len 28 *Mar 1 05:31:46.926: BR2/2:2 LCP:
AuthProto CHAP (0x0305C22305) *Mar 1 05:31:46.926: BR2/2:2 LCP: MagicNumber 0x00B46053
(0x050600B46053) *Mar 1 05:31:46.926: BR2/2:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:46.926:
BR2/2:2 LCP: EndpointDisc 1 Local (0x130901746F7269746F) *Mar 1 05:31:46.938: BR2/2:2 LCP: I
CONFACK [ACKsent] id 24 len 29 *Mar 1 05:31:46.938: BR2/2:2 LCP: AuthProto CHAP (0x0305C22305)
*Mar 1 05:31:46.938: BR2/2:2 LCP: MagicNumber 0x513ED3BF (0x0506513ED3BF) *Mar 1 05:31:46.938:
BR2/2:2 LCP: MRRU 1524 (0x110405F4) *Mar 1 05:31:46.938: BR2/2:2 LCP: EndpointDisc 1 Local
(0x130A016D656C616E6965) *Mar 1 05:31:46.938: BR2/2:2 LCP: State is Open *Mar 1 05:31:46.938:
BR2/2:2 PPP: Phase is AUTHENTICATING, by both *Mar 1 05:31:46.938: BR2/2:2 CHAP: O CHALLENGE id
11 len 28 from "melanie" *Mar 1 05:31:46.958: BR2/2:2 CHAP: I CHALLENGE id 6 len 27 from
"torito" *Mar 1 05:31:46.958: BR2/2:2 CHAP: O RESPONSE id 6 len 28 from "melanie" *Mar 1
05:31:46.974: BR2/2:2 CHAP: I SUCCESS id 6 len 4 *Mar 1 05:31:46.982: BR2/2:2 CHAP: I RESPONSE
id 11 len 27 from "torito" *Mar 1 05:31:46.986: BR2/2:2 CHAP: O SUCCESS id 11 len 4 !--- CHAP
authentication is successful. *Mar 1 05:31:46.986: BR2/2:2 PPP: Phase is VIRTUALIZED *Mar 1
05:31:46.986: BR2/2:2 MLP: torito, multilink up *Mar 1 05:31:47.986: %LINEPROTO-5-UPDOWN: Line
protocol on Interface BRI2/2:2, changed state to up *Mar 1 05:31:52.886: %ISDN-6-CONNECT:
Interface BRI2/2:2 is now connected to 6114 torito !--- Call connection is complete.
melanie#ping 10.10.12.1 Type escape sequence to abort. Sending 5, 100-byte ICMP Echos to
10.10.12.1, timeout is 2 seconds: !!!!! Success rate is 100 percent (5/5), round-trip
min/avg/max = 24/24/24 ms !--- Successful ping. melanie#
```

相关信息

- DDR 多链路 PPP - 基本配置和验证
- 用循环组为多个 BRI 配置 MPPP
- 拨号程序配置文件的配置与故障排除
- ISDN BRI 链路上第二个 B 通道呼叫失败故障排除
- 接入产品支持页面
- 接入技术支持页
- 技术支持 - Cisco Systems